



Attorney Docket No. 001425-104

Patent

001425-104

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

MS AFTER FINAL AMENDMENT

In re Patent Application of

Masahiko Tanaka et al.

Application No.: 09/862,458

Filing Date: May 23, 2001

Title: THIN-FILM DISPOSITION APPARATUS

Group Art Unit: 1763

Examiner: KARLA A MOORE

Confirmation No.: 7476

AMENDMENT/REPLY TRANSMITTAL LETTER

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Enclosed is a reply for the above-identified patent application.

☐ A Petition for Extension of Time is also enclosed.

☐ Terminal Disclaimer(s) and the ☐ \$55.00 (2814) ☐ \$110.00 (1814) fee per
Disclaimer due under 37 C.F.R. § 1.20(d) are also enclosed.

☐ Also enclosed is/are _____

☐ Small entity status is hereby claimed.

☐ Applicant(s) requests continued examination under 37 C.F.R. § 1.114 and enclose the
☐ \$385.00 (2801) ☐ \$770.00 (1801) fee due under 37 C.F.R. § 1.17(e).

☐ Applicant(s) requests that any previously unentered after final amendments not be entered.
Continued examination is requested based on the enclosed documents identified above.

☐ Applicant(s) previously submitted _____

on _____,
for which continued examination is requested.

☐ Applicant(s) requests suspension of action by the Office until at least _____,
which does not exceed three months from the filing of this RCE, in accordance with 37 C.F.R.
§ 1.103(c). The required fee under 37 C.F.R. § 1.17(i) is enclosed.

☐ A Request for Entry and Consideration of Submission under 37 C.F.R. § 1.129(a) (1809/2809) is also
enclosed.

- ☒ No additional claim fee is required.
- ☐ An additional claim fee is required, and is calculated as shown below.

AMENDED CLAIMS					
	No. of Claims	Highest No. of Claims Previously Paid For	Extra Claims	Rate	Additional Fee
Total Claims		MINUS =	0	x \$18.00 (1202) =	\$ 0.00
Independent Claims		MINUS =	0	x \$86.00 (1201) =	\$ 0.00
If Amendment adds multiple dependent claims, add \$290.00 (1203)					
Total Claim Amendment Fee					\$ 0.00
<input type="checkbox"/> Small Entity Status claimed - subtract 50% of Total Claim Amendment Fee					\$ 0.00
TOTAL ADDITIONAL CLAIM FEE DUE FOR THIS AMENDMENT					\$ 0.00

- ☐ A check in the amount of _____ is enclosed for the fee due.
- ☐ Charge _____ to Deposit Account No. 02-4800.
- ☐ Charge _____ to credit card. Form PTO-2038 is attached.

The Director is hereby authorized to charge any appropriate fees under 37 C.F.R. §§ 1.16, 1.17, 1.20(d) and 1.21 that may be required by this paper, and to credit any overpayment, to Deposit Account No. 02-4800. This paper is submitted in duplicate.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

P.O. Box 1404
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(703) 836-6620

Date: June 29, 2004

By



William C. Rowland

Registration No. 30,888



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In re Patent Application of)	MS AFTER FINAL AMENDMENT
Masahiko Tanaka et al.)	
Application No.: 09/862,458)	Group Art Unit: 1763
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For: THIN-FILM DISPOSITION)	Confirmation No.: 7476
APPARATUS)	
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RESPONSE

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

The Examiner is thanked for the careful examination of the application, and for the indication of allowable subject matter. However, in view of the reasons set forth below, the Examiner is respectfully requested to reconsider and withdraw the outstanding rejections.

Art Rejections

Claims 1, 4-5, 8-9, 11, 14-15, 17, 2-24, and 26-27 have been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,083,363, hereinafter Ashtiani et al., in view of U.S. Patent No. 6,086,677, hereinafter Umotoy et al. The Examiner alleges that Ashtiani et al. discloses the invention substantially as claimed in Figure 1. In particular, the Examiner alleges that Ashtiani et al. discloses a vacuum reaction chamber with an electrically conducting dividing plate 52. However, contrary to the assertion of the Examiner, element 52 in Ashtiani et al. is an ion extraction or directing mechanism 52. It is not intended, nor does it

function, as a dividing plate. Specifically, the ion extraction or directing mechanism 52 is a plate 54 having a plurality of apertures 55 formed therein for passing plasma from the source region 12 to the processing region 14. The plate 54 is negatively biased so as to attract positively biased plasma ions 57 from a plasma in the source region 12 and to propel the ions toward the substrate surface 20 to process the surface of the substrate. See column 7, lines 1-5. Thus, the ion extraction or directing mechanism 52 does not function to divide or separate any reagents or gases. In fact, it is an object of the ion extraction or directing mechanism 52 to encourage plasma from the source region 12 to the processing region 14 through the plate 54. See column 6, lines 50-56. Accordingly, the ion extraction or directing mechanism 52 is not intended to divide.

In fact, Ashtiani et al. prevents undesired commingling of the gases by introducing the process gas and the reactant gas at different locations. Specifically, the process gas is fed through passages 25 into the source region 12 and the reactant gas is fed through a feed ring 70 into the processing region 14. Accordingly, there is no need to divide the regions to prevent undesired commingling of the gases. Furthermore, please note that it is an object of Ashtiani et al. to "allow for free passage of plasma species therethrough into the plasma region." See col. 3, lines 19 – 22.

In contrast to Ashtiani et al., the dividing plate of the present invention is specifically intended to divide and separate the radicals generated in the plasma discharge space from the precursor gas which is introduced into internal spaces within the dividing plate. Specifically, the dividing plate is intended to divide, i.e., separate the radicals from the precursor gas, until both are emitted from the dividing

plate within the film deposition process space. Thus, the ion extraction or directing mechanism 52 of Ashtiani et al. does not function in any way like the dividing plate of the present invention. The Examiner appears to recognize this based on the information set forth in paragraph 4 at the bottom of page 2 of the Official Action.

In order to overcome the deficiency of Ashtiani et al., the Examiner relies upon Umotoy et al. for its alleged teaching of a multiple plate gas introduction apparatus with a plurality of holes and internal spaces. The Examiner alleges that it would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to have provided a multiple plate gas introduction apparatus with a plurality of holes and internal spaces in Ashtiani et al. in order to provide at least two gases to a process region without commingling of the gases prior to reaching the process region as taught by Ashtiani et al. However, Ashtiani et al. does not indicate that there is any problem with commingling of the process gases in reactant gases prior to reaching the processing region 14. In fact, such problems do not exist because the reactant gas is introduced directly into the processing region 14 via the feed ring 70.

Thus, neither of the cited references sets forth any credible reason why one of ordinary skill in the art would have been motivated to take the shower head of Umotoy et al. and deploy it in the apparatus disclosed by Ashtiani et al. In fact, the teachings of Ashtiani et al. and Umotoy et al. appear to be inconsistent. Specifically, Ashtiani et al. appears to be doing as much as possible to encourage the migration of the ions from the source region 12 to the processing region 14. It is likely that the showerhead assembly of Umotoy et al. would be inconsistent with the intended goal

of Ashtiani et al. of propelling ions towards the substrate surface 20 from the source region 12.

Accordingly, Applicants submit that one of ordinary skill in the art would not have been motivated to take the showhead from Umotoy et al. and install it in the Ashtiani et al. device.

Thus, the basis for the Examiner's rejection of each of the rejected claims is legally incorrect.

Accordingly, the Examiner is respectfully requested to reconsider and withdraw the outstanding rejections.

In the event that there are any questions concerning this response, or the application in general, the Examiner respectfully urged to the telephone the undersigned attorney so that prosecution of the application may be expedited.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

Date: June 29, 2004

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